CLAIMS

1. A refrigerant compressor comprising:

a closed container;

a compressor section, which is accommodated in the closed container, for compressing refrigerant;

a driver for driving the compressor section; and

a first contact section and a second contact section to be brought into contact with each other or slid with each other by driving the compressor section,

wherein at least one of a plurality of recesses uniformly placed and a mixed layer, to which molybdenum disulfide is bound, is formed on a surface of at least one of the first contact section and the second contact section.

2. The refrigerant compressor of claim 1, wherein the first contact section and the second contact section are sliding components forming the compressor section.

3. The refrigerant compressor of claim 1, wherein the compressor section has a piston and a bore in which the piston is loosely fitted, wherein the first contact section refers to the piston, and the second contact section refers to the bore.

4. The refrigerant compressor of claim 1, wherein the compressor section has a crankshaft including a main shaft and an eccentric section, and a bearing for supporting the main shaft, wherein the first contact section refers to the main shaft, and the second contact section refers to the bearing.

5. The refrigerant compressor of claim 1, wherein the compressor section has:

a crankshaft including a main shaft and an eccentric section;

a piston;

a piston-pin disposed at the piston; and

a connecting rod for coupling the eccentric section to the piston-pin,

wherein the first contact section refers to the piston-pin, and the second contact section refers to the connecting rod.

6. The refrigerant compressor of claim 1,

wherein the driver has a rotor,

wherein the compressor section has a crankshaft including a main shaft and an eccentric section, and a bearing for supporting the main shaft,

wherein the refrigerant compressor further comprises a thrust washer disposed between the rotor and the bearing,

wherein the rotor has a flange face contacting the thrust washer,

wherein the bearing has a thrust section contacting the thrust washer, and

wherein the first contact section refers to the thrust washer, and the second contact section refers to at least one of the flange face and the thrust face.

7. The refrigerant compressor of claim 1, wherein the compressor section has:

a crankshaft including:

a main shaft;

an eccentric section;

a flange section disposed between the main shaft and the eccentric section,

a bearing, for supporting the main shaft, including a thrust section contacting the flange section,

wherein the first contact section refers to the flange section, and the second contact section refers to the thrust section.

8. The refrigerant compressor of claim 1, wherein the compressor section has:

a compressing room;

a rolling piston for rolling in the compressing room; and

a vane for being pushed by the rolling piston to partition the compressing room,

wherein the first contact section refers to the rolling piston, and the second contact section refers to the vane.

9. The refrigerant compressor of claim 1, wherein the compressor section has:

a shaft including a main shaft, a sub-shaft, and an eccentric section;

a rolling piston loosely fitted in the eccentric section;

a main bearing for supporting the main shaft; and

a sub-bearing for supporting the sub-shaft,

wherein a combination of the first contact section and the second contact section refers to at least one of a combination of the eccentric section

and the rolling piston, a combination of the main shaft and the main bearing, and a combination of the sub-shaft and the sub-bearing.

10. The refrigerant compressor of claim 1, wherein the compressor section has at least one of :

a suction valve device including a suction valve port and a suction movable valve, wherein the suction movable valve opens during a sucking operation; and

a discharging valve device including a discharging valve port and a discharging movable valve, wherein the discharging movable valve opens during a discharging operation,

wherein a combination of the first contact section and the second contact section refers to at least one of a combination of the suction valve port and the suction movable valve, and a combination of the discharging valve port and the discharging movable valve.

11. The refrigerant compressor of claim 10, wherein at least one of the suction movable valve and the discharging movable valve is formed of a leaf spring having martensitic surface structure.

12. The refrigerant compressor of claim 10, wherein at least one of the suction movable valve and the discharging movable valve has an arm of which at least one of faces has recesses formed uniformly.

13. The refrigerant compressor of claim 10,

wherein the discharging movable valve has a first striking section,

wherein the discharging valve device further has a stopper, for regulating a motion of the discharging movable valve, and which stopper has a second striking section which is brought into contact with the first striking section by an opening operation of the discharging movable valve,

wherein the first contact section refers to the first striking section, and the second contact section refers to the second striking section.

14. The refrigerant compressor of claim 13, wherein the discharging valve device further has a backup lead disposed between the stopper and the discharging movable valve, the backup lead having a third striking section and a fourth striking section,

wherein a combination of the first contact section and the second contact section refers to at least one of a combination of the first striking section and the third striking section, and a combination of the second striking section and the fourth striking section.

15. The refrigerant compressor of claim 1 further comprising a discharging path for guiding the compressed refrigerant from the compressor section to outside of the closed container; and a resonance preventive section which covers the discharging path,

wherein the first contact section refers to the discharging path, and the second contact section refers to the resonance preventive section.

16. The refrigerant compressor of claim 1 further comprising a supporting section, for resiliently supporting the compressor section in the closed container, which supporting section has the first contact section and the second contact section.

17. The refrigerant compressor of claim 16, wherein the supporting section has:

a first holder for holding the compressor section;

a second holder disposed on an inner wall of the closed container; and

a spring disposed between the first holder and the second holder;

wherein the first contact section refers to the spring, and the second contact section refers to at least one of the first holder and the second holder.

18. The refrigerant compressor of claim 1 further comprising oil which remaining one of in the recesses and on a surface of the mixed layer.

19. The refrigerant compressor of claim 18, wherein the recesses have spherical surfaces.

20. The refrigerant compressor of claim 18, wherein the recesses have a diameter of at least 2μm and at most 50μm, and a depth of at least 0.5μm and at most 10μm.

21. The refrigerant compressor of claim 18, wherein an area occupied by the recesses accounts for at least 40% and at most 80% of a surface area of at least one of the first contact section and the second contact section on which the recesses are formed.

22. The refrigerant compressor of claim 18, wherein a viscosity of the oil

is at least VG5 and less than VG10.

23. The refrigerant compressor of claim 18, wherein the refrigerant is made from hydrocarbon free from chlorine and the oil is mutually soluble with the refrigerant.

24. The refrigerant compressor of claim 18, wherein the refrigerant includes at least one of isobutane and propane, and wherein the oil includes at least one of alkylbenzene, mineral oil, ester, polyvinylether and polyalkyleneglycol.

25. The refrigerant compressor of claim 1, wherein the first contact section and the second contact section are made of iron-based base material, and a surface structure of at least one of the first contact section and the second contact section is martensitic.

26. The refrigerant compressor of claim 1, wherein a purity of the molybdenum disulfide of the mixed layer is at least 98%.

27. The refrigerant compressor of claim 1, wherein the mixed layer is formed on surfaces of the recesses.

28. A refrigerating machine comprising:

a refrigerant compressor having:

a closed container;

a compressor section, which is accommodated in the closed container, for compressing refrigerant;

a driver for driving the compressor section; and

a first contact section and a second contact section to be brought into contact with each other or slid with each other by driving the compressor section,

wherein at least one of a plurality of recesses uniformly placed and a mixed layer, to which molybdenum disulfide is bound, is formed on a surface of at least one of the first contact section and the second contact section,

a first heat exchanger coupled to a high pressure side of the refrigerant compressor;

a second heat exchanger coupled to a low pressure side of the refrigerant compressor; and

an expansion valve disposed between the first heat exchanger and the second heat exchanger.